FORM PTO-1390 (REV. 10-96)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY DOCKET NUMBER
	TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371	A-70704/DJB/MAK
		U.S. APPLICATION NO. (If known, sect 37 C.F.R. 1.5) 09/869408 Not Yet Known

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/AU99/01139	23 December 1999	23 December 1998

TITLE OF INVENTION

A SYSTEM AND METHOD FOR INTELLIGENT NETWORK SERVICES

APPLICANT(S) FOR DO/EO/US

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Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau. **(see enclosed Form PCT/IB/308)**
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Other items or information.

JC03 Rec'd PCT/PTC 22 JUN 2001

ATION NO. (If known, see 37 C.F.R. 1.63) Yet Known 09/869408	INTERNATIONAL APPLICATION NO. PCT/AU99/01139	ATTORNEY'S DOCKET NUMBER A-70704/DJB/MAK

17. ☒ The following fees are submitted:	CALCULATIONS (PTO USE ONLY)	
Basic National Fee (37 CFR 1.492(a)(1)-(5)):		
Search Report has been prepared by the EPO or JPO $860.00		
International preliminary examination fee paid to USPTO (37 CFR 1.482) $690.00		
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) $710.00		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO $1,000.00		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 1,000.00	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☒ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ 130.00	

CLAIMS	NUMBER FILED		NUMBER EXTRA	RATE		
Total Claims	29	-20 =	9	18.00	$ 162.00	
Independent Claims	3	-3 =	0	80.00	$ 0.00	
Multiple dependent claim(s) (if applicable)				270.00	$ 270.00	
TOTAL OF ABOVE CALCULATIONS =					$ 1,562.00	
Reduction by 1/2 for filing by small entity, if applicable. Applicant claims small entity status. (See 37 CFR 1.27.) Yes: ☐ No: ✓					$ 0.00	
SUBTOTAL =					$ 1,562.00	
Processing fee of $130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +					$	
TOTAL NATIONAL FEE =					$ 1,562.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +					$	
TOTAL FEES ENCLOSED =					$ 1,562.00	
					Amount to be: refunded	$
					charged	$

a. ☒ A check in the amount of $ 1,562.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. 06-1300 (Order No. _____) in the amount of $ _____ to cover the above fees.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-1300 (Order No. A-70704/DJB/MAK).

NOTE: **Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

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NAME

32,998
REGISTRATION NUMBER

A SYSTEM AND METHOD FOR INTELLIGENT NETWORK SERVICES

The present invention relates to a call processing method and a network system, which are particularly, but not exclusively, useful in executing Intelligent Network (IN) services which may be provided across a number of different telecommunications networks.

IN services, such as call forwarding, call diversion and messaging services, are provided in fixed telecommunication networks by a traditional structure which has dedicated IN computer logic for each network and which is common across all switching nodes of the network to service those nodes. The nodes, normally located in exchanges of the network, act as Service Switching Points (SSPs) which can be triggered on a characteristic of an incoming or outgoing call to send data associated with the call to a Service Control Point (SCP) of the computer logic to process an IN service. The SCP determines how the service is to be processed and may need to access data at a Service Data Point (SDP) of the logic in order to execute the service. The SCP then feeds the required information back to the SSP to complete execution of the service and direct the call handled by the SSP appropriately. The IN computer logic is normally held in one central location for its respective network, and all IN services need to be processed at that central location. Mobile telecommunications networks, such as GSM, AMPS and CDMA networks are also able to execute IN services respectively, such as messaging services. The mobile networks however do not rely on discrete and separate IN computer logic for each network, but instead rely on computer logic which is built into the components of each network, such as the Base Station Controllers (BSC) and the Mobile Switching Centres (MSC). All of the networks execute their own respective communication protocols to access IN service data and execute IN services.

It is desired to provide a method or system which enables IN services to be delivered efficiently across a number of telecommunications networks, and which alleviates the restrictions imposed by the existing network specific architectures and processes described above, or which at least provides a useful alternative.

In accordance with the present invention there is provided a call processing method, including:

processing characteristic data associated with a communications call at a network switch to determine if intelligent network (IN) service data is required to establish said call;

passing said characteristic data to a network service data gateway when said service data is required;

processing at least part of said characteristic data by said gateway to determine a network location to access in order to obtain said service data, and a communication protocol for connecting to said network location; and

obtaining said service data and passing said service data to said switch to establish said call.

The present invention also provides a network system having:

a network switch for processing characteristic data associated with a communications call to determine if Intelligent Network (IN) service data is required to establish said call;

a network service data gateway for receiving said characteristic data from said network switch when said service data is required, said gateway being adapted to process at least part of the characteristic data to determine a network location to access in order to obtain said service data, and a communication protocol for connecting to said network location; and

wherein said gateway is adapted to receive said service data and pass the service data to said switch to establish said call.

Preferred embodiments of the present invention are hereinafter described, by way of example only, with reference to the accompanying drawings, wherein:

Figure 1 is a schematic diagram of a preferred embodiment of a network system;

Figure 2 is a schematic diagram of part of the network system providing voice messaging services;

Figure 3 is a block diagram of part of the network system providing IN terminating services;

Figure 4 is a block diagram of the network system;

Figure 5 is a block diagram of part of the network system performing mobile terminated SMS policing;

Figure 6 is a block diagram of the network system performing mobile originated SMS

policing; and

Figure 7 is a block diagram of part of the network system providing local switching access for a private network.

An intelligent network system 2, as shown in Figure 1, is able to process IN service requests and, in particular, handle a range of mobile originating IN services, such as access to messaging services, as well as a range of terminating IN services. The system 2 includes a plurality of telecommunications networks 4 to 12 and private networks 14 or stations 16 which are able to communicate with an IN gateway 20 for the provision of IN service data. The telecommunications networks including foreign networks 4, a local intelligent switching network 6, such as the PSTN, and mobile networks, such as a CDMA network 8, an AMPS network 10, and a GSM network 12. The gateway 20 can also communicate with Base Station Systems (BSS) of an office network 14 or a private home 16.

The gateway 20 of the system 2 has computer logic 22 which is configured to communicate with the networks 4 to 14 and the BSS 16 using the respective communication protocols for the networks 4 to 14 and the BSS 16, and is also able to respectively poll for IN service data requests from the networks 4 to 14 and the BSS 16. The system 2 provides a central "home" layer and a "visitor" layer by having a central Home Intelligent Network (HIN) 24 which maintains central IN service data and a plurality of Visitor Intelligent Networks (VINs) 26 which are distributed amongst at least the local networks 6 to 14 and the BSSs 16 which the IN system 2 needs to serve. The VINs 26 each include the computer logic 22 and act as the gateway 20 for communicating with the networks 4 to 14 and the BSSs 16. The VIN logic 22 is able to communicate with the HIN 24, using INAP or TCP/IP, to obtain IN service data information. For example, an IN service data request may be triggered in one of the switching nodes of the networks 4 to 12 in order to enable the node to process a call request. The IN service data request may have been triggered by the node on the basis of the called number, the called number and the calling number or categories of the A or B parties associated with the call. The service request is received by the VIN logic 22, which initially will refer to the HIN 24 concerning the requests. The HIN 24 maintains a customer database 28 which maintains simple look up tables for customers or subscribers and an IN service database 30 to process IN service data requests associated with more complex IN services, such as sophisticated call diversion and Virtual Private Networks (VPNs). The customer database 28 may provide service

data such as which network the call relates to and an address within that network where further information on the B party can be obtained. The IN service database 30 may provide complete service data on how to establish the call together with billing information. The service data is fed back to the requesting node via the VIN logic 22 which stores a copy of the service data in a local cache for subsequent similar requests. Caching of the data by the VIN 26 allows a large number of local IN service data requests to be processed without referring to the HIN 24, therefore significantly saving on network resources. Therefore whilst the HIN 24 functions primarily as an SDP and the VIN 26 as an SCP, the HIN 24 also acts as an SCP and the VIN as an SDP, contrary to traditional IN architectures.

The IN system 2 provides, as described in more detail below, the following:

(i) home and visitor based management of IN service data and control logic.

(ii) customer independence from the terminating IN service, the terminating network and the final terminal.

(iii) protocol independence from the terminating network.

(iv) private network access to public mobility data.

(v) terminal network selection.

(vi) policing of messages from other networks, such as international networks.

For traditional mobile networks, such as a GSM network 12, mobility related data follows a customer or subscriber as they change their servicing Mobile Service Centre (MSC) when moving from one part of the network to another. The IN system 2 in its home and visitor management of IN data maintains VINs 26 for respective regions or areas, but only transports IN data to the VINs 26 from the HIN 24 when an IN service is invoked. The data sent from the HIN 24 to a VIN 26 is cached locally in the VIN 26 for a predetermined period of time, such that if the IN service is invoked again within that period, the data can be provided locally from the VIN 26 to a local switch 32, without accessing the HIN. If customer data is changed in the HIN 24 all of the relevant VINs 26 containing a copy of the data are updated by the system 2. Data changes in the HIN 24 can be initiated by a subscriber using a VIN 26 or directed directly to the HIN 24. The predetermined period for data retention by a VIN 26 may be one or two days.

An example of Originating IN Service (OINS) management by the system 2 is processing of a voice message service request, as shown in Figure 2, where a customer in Perth

dials 101 to access any stored messages. The call request is received by a switch 32 located in Perth which on processing the called number sends an IN service data request to a VIN 26 located in Perth. The service data request includes the calling and called numbers so the customer can be identified. If the relevant IN service data is not cached within the VIN 26, the VIN contacts the HIN 24 to obtain the hidden address for the customer's mailbox. This address is then cached in the VIN 26 and passed back to the switch 32 with data instructing the switch 32 to direct the call to the voice message service database 36. The switch 32 establishes the call to the database 36 and passes the hidden address to the database 36 to enable the customer to access his/her mailbox. On flying to Melbourne, the IN service data which enables the customer to access his/her mailbox in the database 36 is only transferred to the VIN 26 in Melbourne when the customer makes a call to the mailbox by dialling 101. The VIN 26 in Melbourne will then execute the same service to obtain the mailbox data, which it then retains in its local cache for subsequent mailbox requests.

For Terminating IN Service (TINS) management, the network system 2 in processing a request to establish a call is able to forward appropriate terminating IN script, as described below, from the HIN 24 to a VIN 26, and then provide the terminating script to a local switch 32 or 34 which is used to establish the call. The script may forward the call to another network, implement a mobile technology specific operation or invoke a particular IN service at the terminating end. The mobile specific operation may be obtaining a "Roaming" number or executing a "Call Screening" function when a user is roaming overseas.

The network system 2 provides network and terminal independence for a customer because the data which is held for each customer by the HIN 24 is accessible by all of the telecommunication networks 4 to 14 and BSSs 16 using the HIN/VIN architecture. The data maintained by the HIN 24 for each customer includes data on what network the customer belongs to, the type of technology associated with the network, where further data on the customer can be obtained, such as the location of a Home Location Register (HLR) and what terminal identity, i.e. terminal number, to use. Data on additional IN services associated with the customer may also be included, which may require more than one network to be contacted before a call to the customer can be established. Customers associated with different networks can have priorities assigned to the networks for establishing a call to the customer. The HIN data may also specify an appropriate messaging service to be contacted if a customer cannot be

located on one or more networks.

For example, a customer may have a mobile terminal 40 allocated a terminating number 0418 123 456, and whilst the customer has the terminal 40 switched on in Brisbane, as shown in Figure 3, location data is copied into a Visitor Location Register (VLR) 44 of the MSC 42 in Brisbane and the GSM HLR database 46, in accordance with standard GSM network procedures. A caller 48 on the PSTN 50 in Perth placing a call to the customer dials the customer's number which is passed to the switch 32 in Perth for processing. The switch 32 contacts the VIN 26 in Perth using the ATUP, ISUP or INAP protocols and asks the VIN to forward IN service data to it so it can establish the call. The VIN 26 contacts the HIN 24 using INAP to obtain data on the customer on the basis of the terminating number. Using the number, the HIN 24 accesses data to determine on which network 4 to 14 the customer resides and where the VIN 26 can access further data on the customer's location. For a GSM customer, the HIN 24 provides data back to the VIN 26 specifying the address for the GSM HLR 46 the VIN 26 needs to contact and also advising the VIN 26 that it needs to use the MAP protocol to communicate with the HLR 46. The VIN 26 then contacts the HLR 46 to obtain the location of the customer, and in particular a GSM roam number which can be used to route the call to the customer. This data is then forwarded to the switch 32 by the VIN 26. The switch 32 then uses the roam number to route the call from the caller 48 to the MSC 42 and onto the terminal 40. Similar processing occurs if a caller 52 on a mobile network in Melbourne places a call to the terminal 40, with the call being processed and established by the VIN 26 and the switch 34 in Melbourne. The architecture of the network system is particularly advantageous as it provides one gateway 20 for use in terminating all mobile network calls for different networks 8 to 12, without requiring reference or reliance on gateways which are specific to each mobile network 8, 10 or 12. Once calls to the terminal 40 are completed, the VINs 26 retain their local cache data specifying that the terminal 40 is a GSM terminal, the HLR 46 which needs to be contacted for a roam number and the protocol, MAP, which needs to be used.

The network system 2 provides technology independent processing of IN services by having a generic IN service front end in the VIN 26, which uses standard protocols such as ATUP, ISUP or even INAP to communicate with a front end local exchange switch 32, such as an MSC, depending on the protocol used by the switch 32, as shown in Figure 4. The computer logic 22 of the VIN 26 translates the generic protocol service requests from the switch 32 into

a back end technology specific transaction according to a customer's IN script which it obtains from the HIN databases 28 and 30 or which may already be stored in the VINs local cache 23. The IN script specifies the specific communication protocol to be used to obtain IN service data from technology specific network equipment 54. For example, the VIN logic 22 can communicate using IS41 with an HLR 56 of a CDMA network 8, MTUP to communicate with an HLR 58 of an AMPS network 10, and MAP or INAP to communicate with an HLR 46 of a GSM network 12. The VIN 22 may also need to use INAP, on instructions from the HIN 24 to contact an INAP based IN 60 to obtain specific call routing information or IN service data or to connect with an intelligent network peripheral. An IN service data request to the VIN 26 will normally be triggered within a switch 32 on processing a call based on the called number, the called number and the calling number, or categories or ranges associated with A or B parties or both for a call. The VIN 26 then processes the IN service data request so as to establish the service data required by the switch 32, which as discussed, may be obtained directly from the HIN 24 or may involve contacting different network technology specific equipment 54.

The network system 2 determines which network 4 to 12 should be used to originate a call when more than one network is available for a terminal. The occurs when the terminal is one of the following:

(a) a multimode terminal where both modes are available at all times, and is referred to as a parallel mode terminal.

(b) a multimode terminal where only one mode is available at any given time, and is referred to as a dual mode terminal.

(c) a single mode terminal which can access different network layers of a network. This covers radio layering which may be used when not all services are offered on all network layers.

(d) a single mode terminal which can access only one network but the network can be switched between private and public modes.

The network system 2 enables the appropriate operating mode for the terminals to be selected, either using terminal based selection, network prompted terminal selection or network selection, as described below.

Terminal based selection can be used in multimode terminals which can be set to select

different networks depending on the type of call made, e.g. voice, fax, data or messaging service. For example, a dual mode terminal operating with a Cordless Base Unit (CBU) 16 can be connected to the CBU 16 or a mobile network 8, 10 or 12. The terminal would be set to send certain calls via the mobile network, such as fax and data calls, and other calls via the CBU. When the CBU is busy, the terminal can send calls via the mobile network 8, 10 or 12, and will be handled by the gateway 20, which may apply a discount call tariff if the gateway 20 can confirm the terminal is in the coverage area of the CBU, i.e. the terminal is "at home".

For network prompted terminal selection, the VIN 26 provides via the switch 32 instructions to a terminal regarding a choice of networks to use for originating a call. The VIN 26 provides messages detailing networks to be attempted in a priority based order.

For network selection, the VIN 26 retrieves service data in order to make a decision for a switch 32 and ultimately the terminal connected to it, as to which network should be used based on either the terminal identity, the requested service or the requested destination. For example, in a private wireless office environment, calls destined to the PSTN may be switched locally in the office, whereas public and private users requesting services only supported on the public mobile network, such as SMS, fax and data services, and private users requesting voice IN services only available on the public mobile network, such as voice message services, would all have their calls switched back through the public mobile network.

The network system 2 is also able to perform SMS policing and in particular can apply it to policing of international SMS traffic.

Policing of mobile terminated SMS traffic coming into a local network can protect local customers from unwanted SMS traffic originated by a foreign network 4. Policing is achieved by having all international MAP traffic destined to local network HLRs 46, 56 and 58 routed through a VIN 26, as shown in Figure 5. All SMS traffic except the MAP SMS Send Routing Information (SRI) message to the local HLR 46 is passed transparently. The SRI messages are screened by the VIN 26 to determine the originating global title address of the Short Message Service Centre (SMSC) and the destination mobile. SRI messages that are not on a bar list are passed to the appropriate HLR 46, and acknowledged with an SRI_ACK message as usual, whereas SRI messages that are barred are returned to the SMSC with a request rejected message

SRI_NAK generated by the VIN 26.

Incoming mobile originated SMS policing can protect local SMSCs from unwanted SMS traffic originated in foreign networks 4, as well as providing a mechanism for load sharing between the SMSCs 70 of the local network 12. The MAP Forward Short Message (FSM) messages generated by a mobile terminal 40 are passed via VIN 26 to SMSC 70 of a local network 12 to determine if the traffic is allowed to pass, and if so, to which final service centre address the traffic should be sent to. The decision to enable the traffic to proceed to the network 12 is based on analysis of the originating foreign network 4, the originating terminal address, and the destination SC address. Following the analysis, only customers of the local network 12 roaming overseas may be allowed to originate and send traffic to an SMSC 70, and the network system 2 can distribute the messages evenly to all SMSCs 70 of the local network 12. Messages passed are acknowledged with an FSCM_ACK signal back to the mobile from the SMSC 70 via a VIN 26, otherwise if a message is refused, the VIN 26 generates an FSCM_NAK signal for the mobile 40, as shown in Figure 6.

Similarly, outgoing mobile originated SMS destined for foreign networks can be policed to determine foreign networks 4 and the foreign SMSCs 72 which local customers are allowed access to from a carrier's network including the system 2. The VIN 26 may refuse to pass FSM traffic based on the identity of the terminal 40 originating the message, the destined network 4 or the destination SC address of the SMSC 72. Appropriate FSCM_ACK and FSCM_NAK signals will be passed back to a mobile terminal 40 via the local network 12.

Local switching access to mobility data is provided for a private network 14, as shown in Figure 7.

Many modifications will be apparent to those skilled in the art without departing from the scope of the present invention as herein described with reference to the accompanying drawings.

CLAIMS:

1. A call processing method, including:

processing characteristic data associated with a communications call at a network switch to determine if intelligent network (IN) service data is required to establish said call;

passing said characteristic data to a network service data gateway when said service data is required;

processing at least part of said characteristic data by said gateway to determine a network location to access in order to obtain said service data, and a communication protocol for connecting to said network location; and

obtaining said service data and passing said service data to said switch to establish said call.

2. A call processing method as claimed in claim 1, including storing said service data in said gateway for subsequent requests for said service data.

3. A call processing method as claimed in claim 2, including deleting said service data from said gateway after a predetermined period of time.

4. A call processing method as claimed in claim 1, wherein said network location is in a central IN service data database.

5. A call processing method as claimed in claim 1, wherein said network location is in a local mobile network.

6. A call processing method as claimed in claim 1, wherein said network location is in a foreign telecommunications network.

7. A call processing method as claimed in claim 1, wherein said gateway is local to a user originating said call.

8. A call processing method as claimed in claim 1, wherein said gateway includes Visitor IN (VIN) computer logic for obtaining and caching service data for users in the area of said

gateway.

9. A call processing method as claimed in claim 8, wherein said network location is within Home IN (HIN) computer logic including a central IN service data database.

10. A call processing method as claimed in any one of the preceding claims, wherein said communication call includes a voice, data or messaging connection.

11. A network system having:

a network switch for processing characteristic data associated with a communications call to determine if Intelligent Network (IN) service data is required to establish said call;

a network service data gateway for receiving said characteristic data from said network switch when said service data is required, said gateway being adapted to process at least part of the characteristic data to determine a network location to access in order to obtain said service data, and a communication protocol for connecting to said network location; and

wherein said gateway is adapted to receive said service data and pass the service data to said switch to establish said call.

12. A network system as claimed in claim 11, wherein said gateway stores said service data for subsequent requests for said service data.

13. A network system as claimed in claim 12, wherein said gateway deletes said service data after a predetermined period of time.

14. A network system as claimed in claim 11, wherein said network location is in a central IN service data database.

15. A network system as claimed in claim 11, wherein said network location is in a local mobile network.

16. A network system as claimed in claim 11, wherein said network location is in a foreign telecommunications network.

17. A network system as claimed in claim 11, wherein said gateway is local to a user originating said call.

18. A network system as claimed in claim 11, wherein said gateway includes Visitor IN (VIN) computer logic for obtaining and caching service data for users in the area of said gateway.

19. A network system as claimed in claim 18, wherein said network location is within Home IN (HIN) computer logic including a central IN service data database.

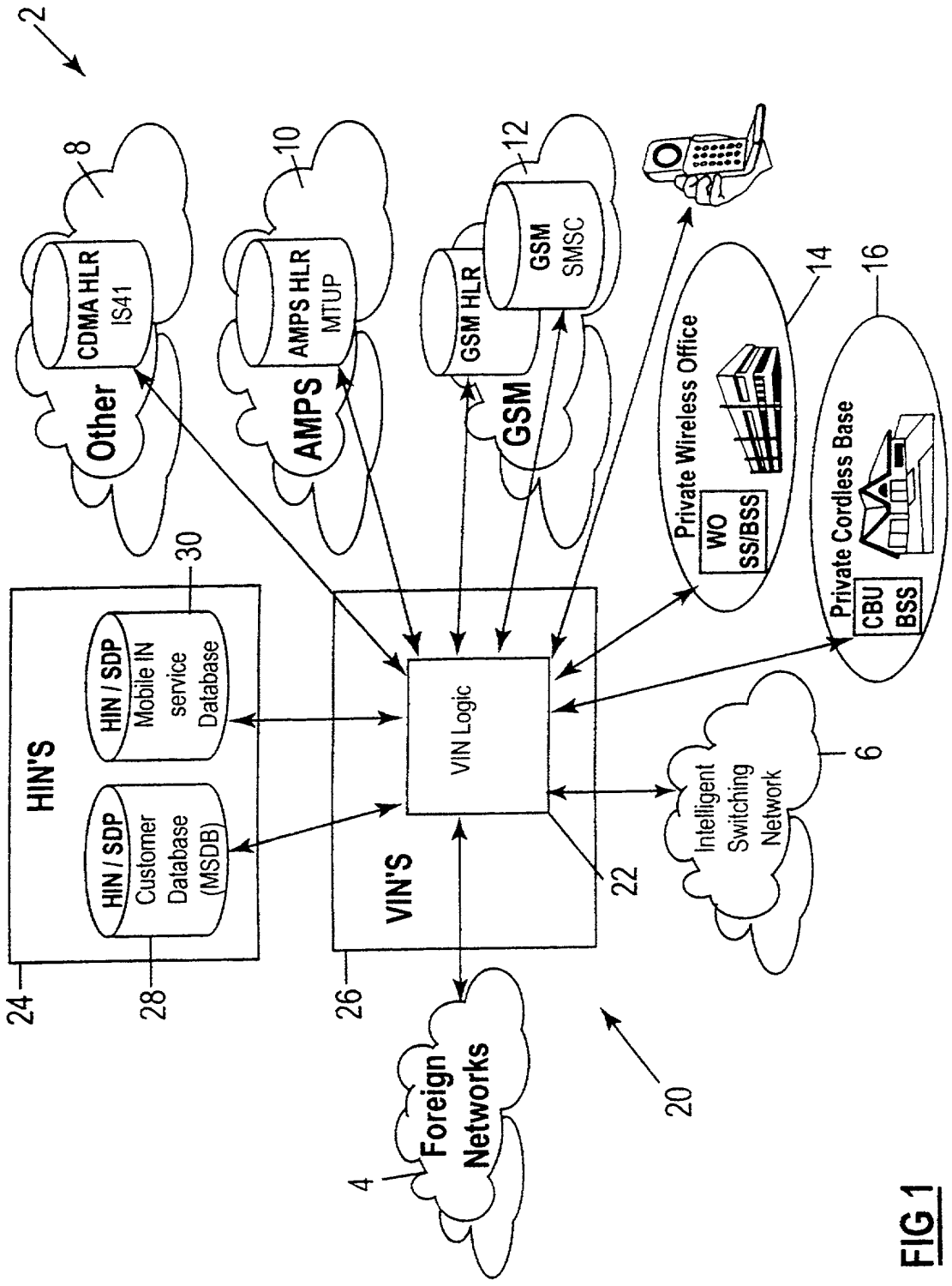
20. A network system as claimed in any one of the preceding claims, wherein said communication call includes a voice, data or messaging connection.

21. A network system as claimed in claim 11, including a plurality of said gateway covering respective areas.

22. A network system as claimed in claim 11, wherein said service data is public mobility data.

23. A network system as claimed in claim 11, wherein said service data is terminal network selection data.

24. A network system as claimed in claim 11, wherein said gateway includes means for policing messages passed between networks.


2
8
10
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GSM SMSC
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14
16
Private Cordless Base
CBU
BSS
HIN'S
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service
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Networks
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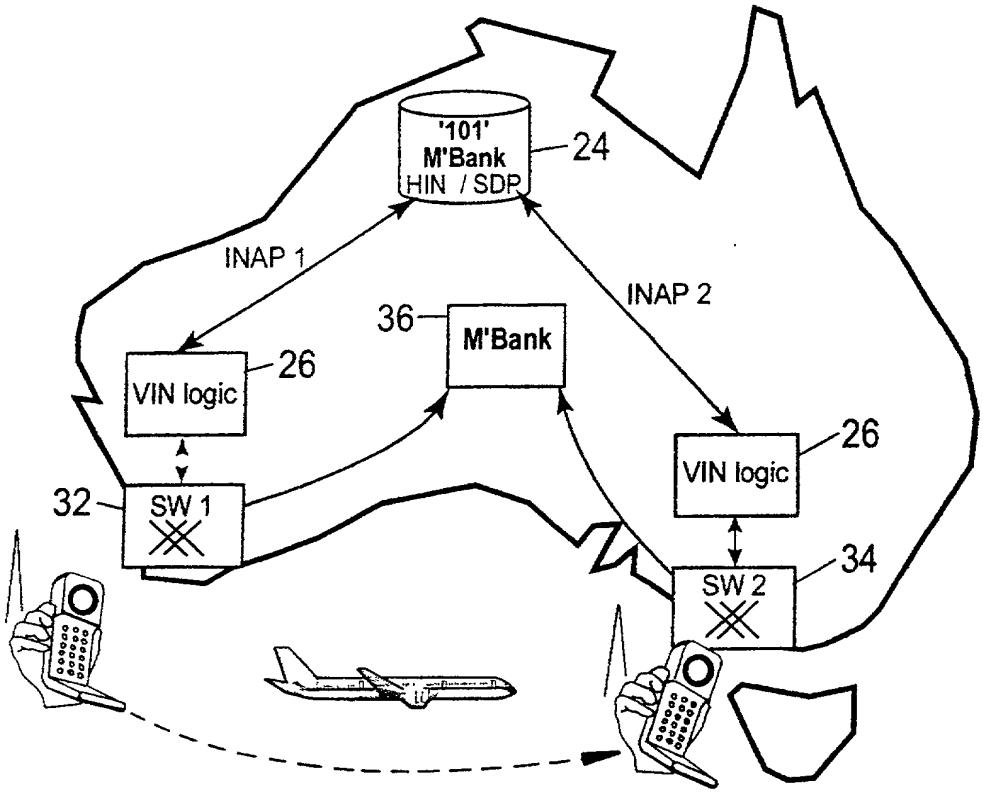
20

FIG 1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VIN logic
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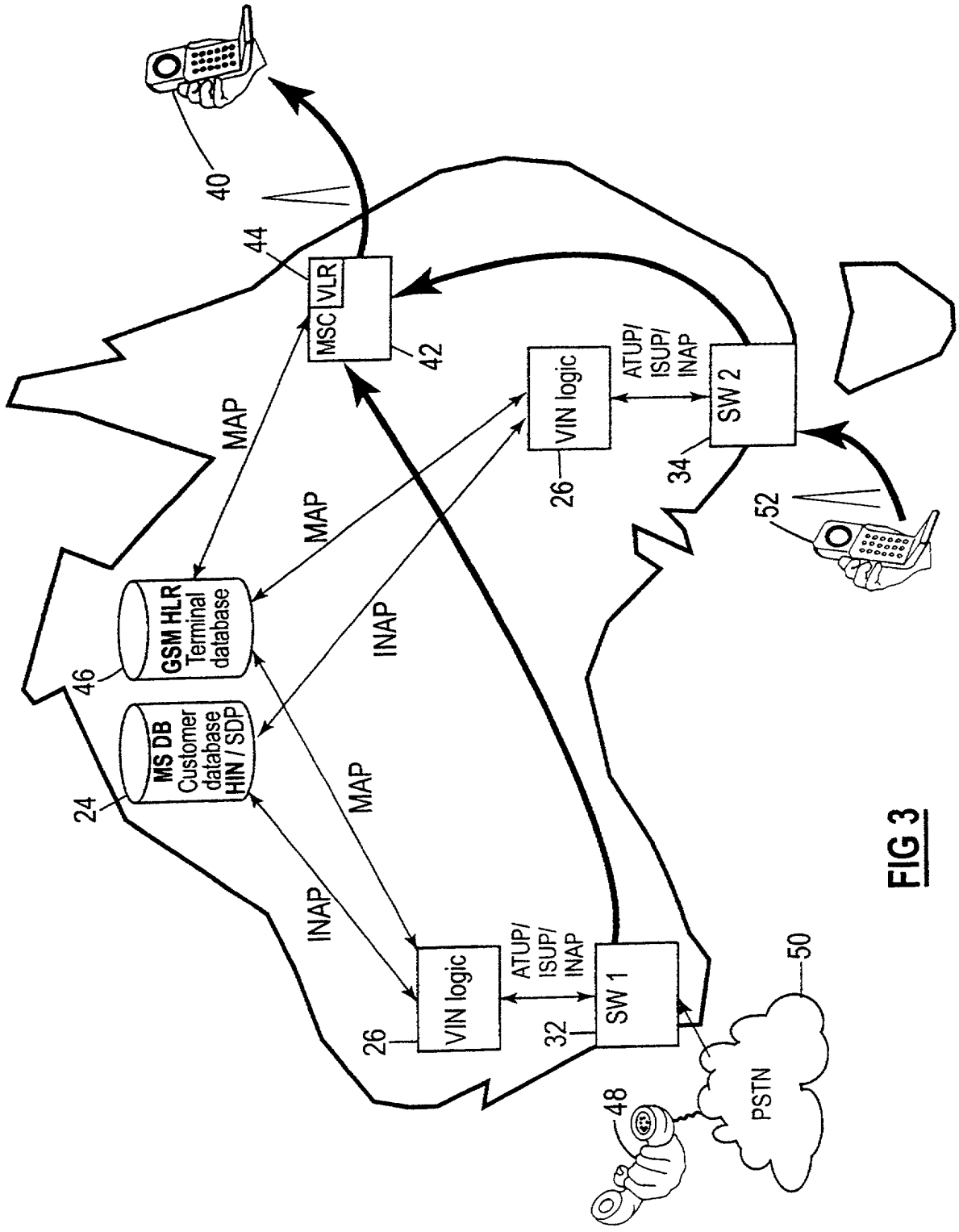
SW 1
SW 2
34

FIG 2


40
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GSM HLR
Terminal
database
46
MS DB
Customer
database
HIN / SDP
24
VIN logic
26
ATUP/
ISUP/
INAP
SW 1
32
VIN logic
26
ATUP/
ISUP/
INAP
SW 2
34
52
48
PSTN
50

FIG 3

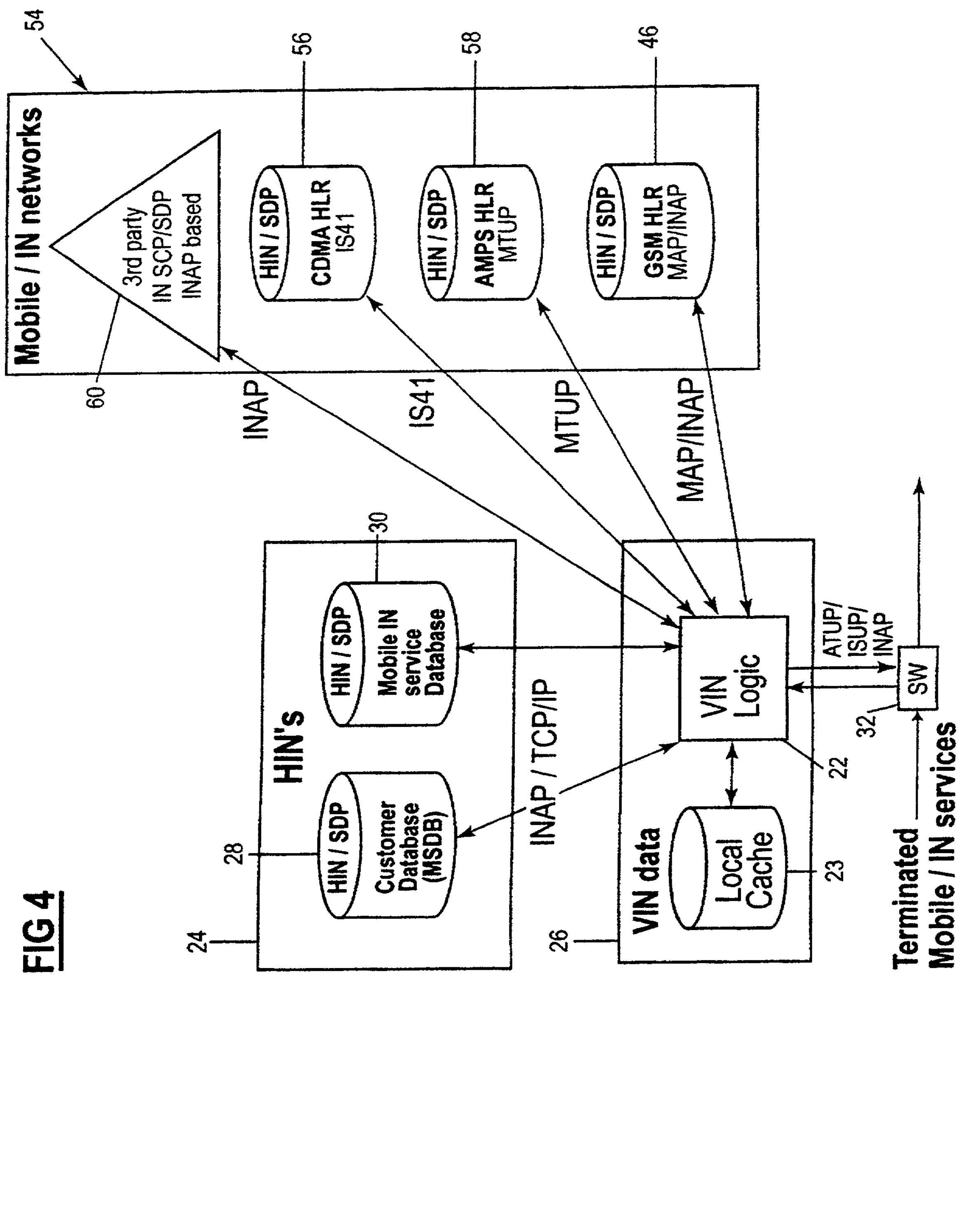
Mobile / IN networks
54
3rd party
IN SCP/SDP
INAP based
60
56
HIN / SDP
CDMA HLR
IS41
58
HIN / SDP
AMPS HLR
MTUP
46
HIN / SDP
GSM HLR
MAP/INAP
INAP
IS41
MTUP
MAP/INAP
HIN's
24
28
HIN / SDP
Customer
Database
(MSDB)
30
HIN / SDP
Mobile IN
service
Database
INAP / TCP/IP
VIN data
26
Local
Cache
23
VIN
Logic
22
ATUP/
ISUP/
INAP
SW
32
Terminated
Mobile / IN services

FIG 4

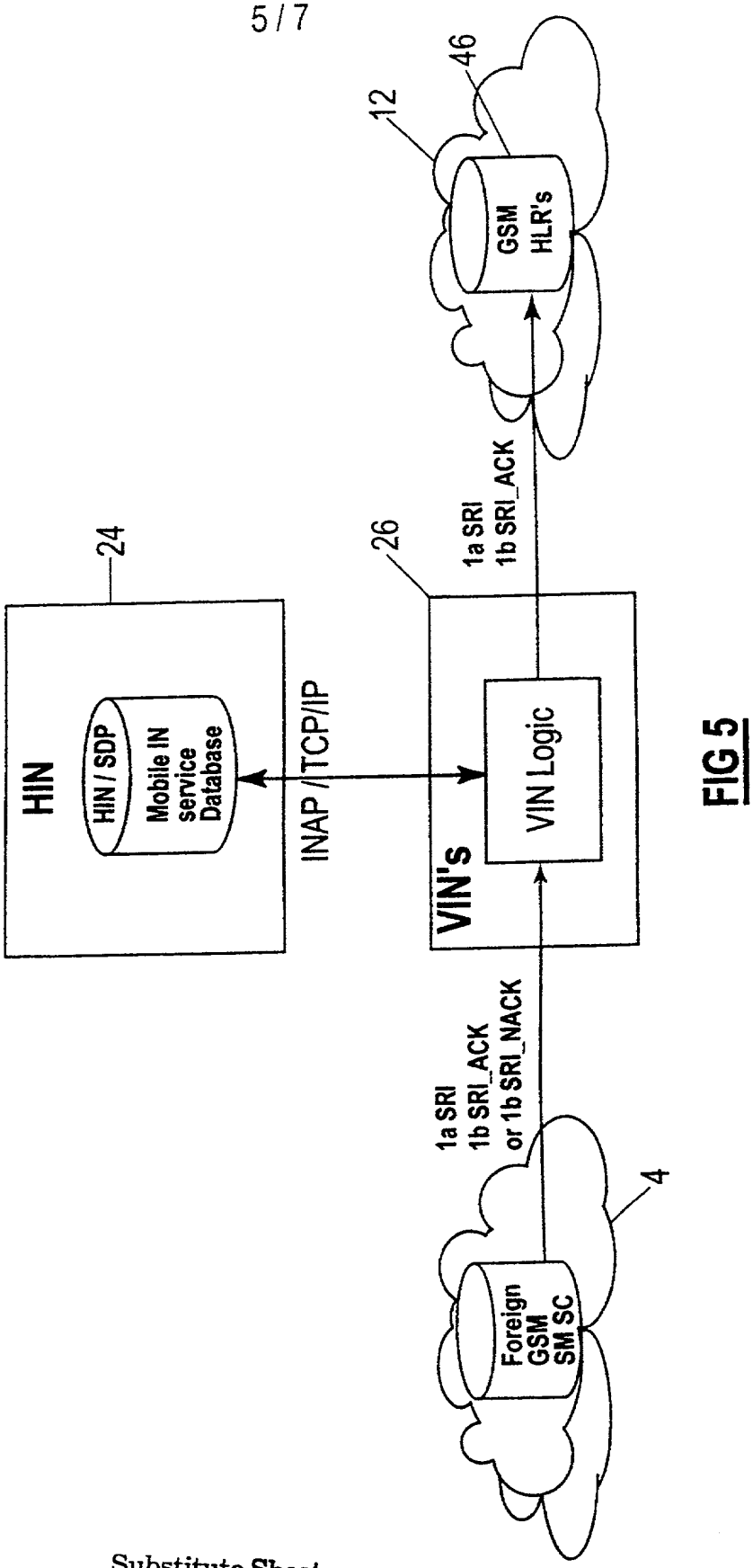
12
46
GSM HLR's
1a SRI
1b SRI_ACK
24
26
HIN
HIN / SDP
Mobile IN service Database
INAP /TCP/IP
VIN's
VIN Logic
1a SRI
1b SRI_ACK
or 1b SRI_NACK
4
Foreign GSM SM SC

FIG 5

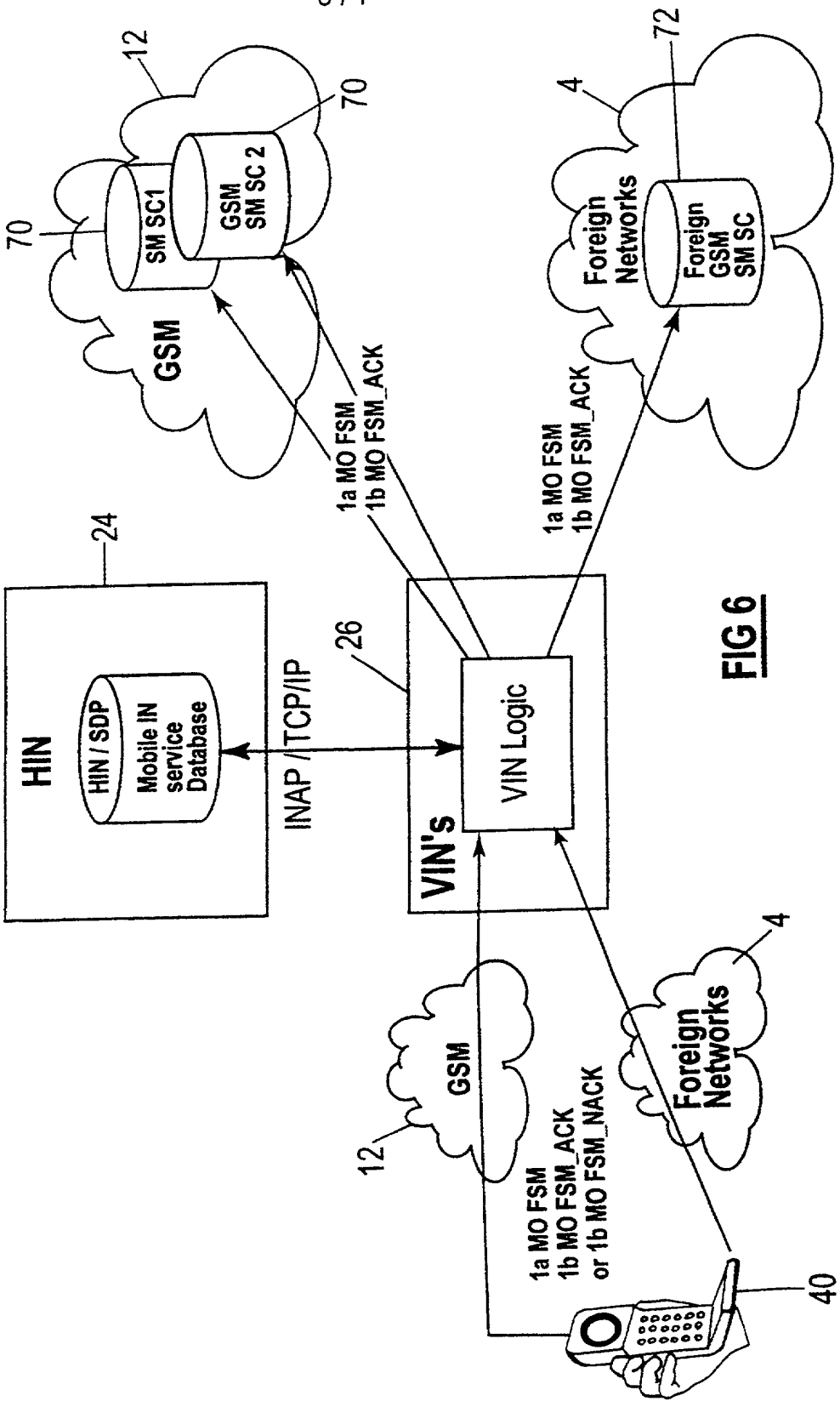
12
70
70
SM SC1
GSM SM SC 2
GSM
4
72
Foreign Networks
Foreign GSM SM SC
1a MO FSM
1b MO FSM_ACK
1a MO FSM
1b MO FSM_ACK
24
HIN
HIN / SDP
Mobile IN service Database
INAP /TCP/IP
26
VIN's
VIN Logic
12
GSM
4
Foreign Networks
1a MO FSM
1b MO FSM_ACK
or 1b MO FSM_NACK
40

FIG 6

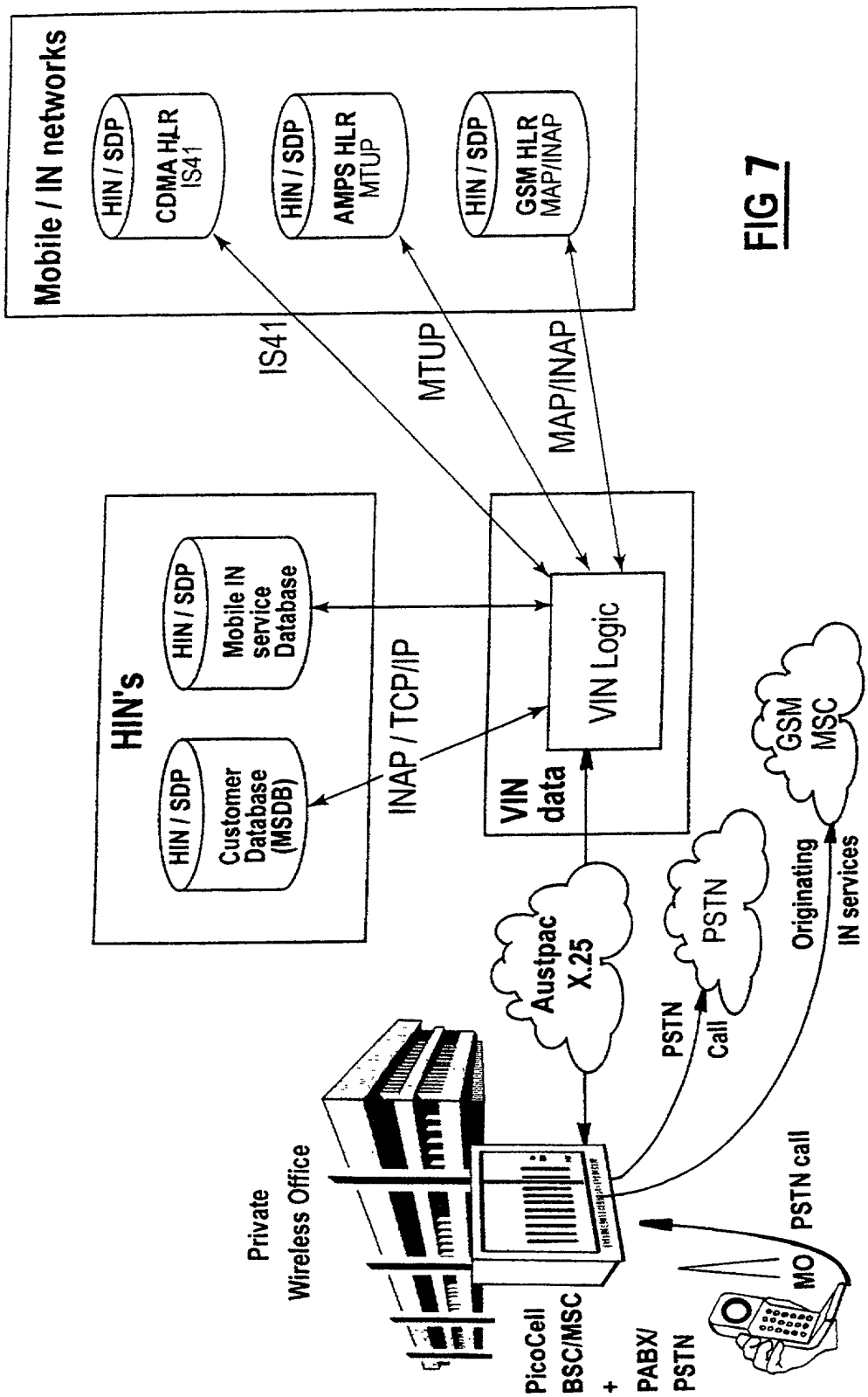
Mobile / IN networks
HIN / SDP
CDMA HLR
IS41
HIN / SDP
AMPS HLR
MTUP
HIN / SDP
GSM HLR
MAP/INAP
IS41
MTUP
MAP/INAP
HIN's
HIN / SDP
Mobile IN service Database
HIN / SDP
Customer Database (MSDB)
INAP / TCP/IP
VIN data
VIN Logic
GSM MSC
Originating
IN services
Austpac X.25
PSTN
PSTN
Call
Private Wireless Office
PicoCell BSC/MSC + PABX/ PSTN
MO
PSTN call

FIG 7

DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled A SYSTEM AND METHOD FOR INTELLIGENT NETWORK SERVICES,

the specification of which

[X] International Patent Application No PCT/AU99/01139 filed 23 December, 1999

(check one) ☐ is attached hereto.

☐ was filed on _____ as Application Serial No. _____ and was amended on _____. (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
PP7917/98 (Number)	Australia (Country)	23 December, 1998 (Day/Month/Year Filed)	☒ Yes	☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes	☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes	☐ No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulation, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
_____	_____	_____
_____	_____	_____

I hereby appoint the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: Harold C. Hohbach, Reg. No. 17,757; Aldo J. Test, Reg. No. 18,048; Thomas O. Herbert, Reg. No. 18,612; Donald N. MacIntosh, Reg. No. 20,316; Jerry G. Wright, Reg. No. 20,165; Edward S. Wright, Reg. No. 24,903; David J. Brezner, Reg. No. 24,774; Richard E. Backus, Reg. No. 22,701; James A. Sheridan, Reg. No. 25,435; Robert B. Chickering, Reg. No. 24,286; Willis E. Higgins, Reg. No. 23,025; Gary S. Williams, Reg. No. 31,066; Richard F. Trecartin, Reg. No. 31,801; Stephen C. Durant, Reg. No. 31,506; C. Michael Zimmerman, Reg. No. 20,451; Walter H. Dreger, Reg. No. 24,190; _____;

provided that if any one of said attorneys ceases being affiliated with the law firm of Flehr, Hohbach, Test, Albritton & Herbert as partner, employee or of counsel, such attorney's appointment as attorney and all powers derived therefrom shall terminate on the date such attorney ceases being so affiliated.

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San Francisco, California 94111

File No. _____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Date: × 27-08-01

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Inventor's signature: Russell

Date: 6th September 2001

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Inventor's signature:

Date:

Residence:

Citizenship:

Post Office Address:

Full name of fifth joint inventor, if any:

Inventor's signature:

Date:

Residence:

Citizenship:

Post Office Address: